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ABSTRACT

The Treatment Evaluation Project was established to evaluate the feasibility of using behavioral treatment in conjunction with methadone maintenance to improve the effectiveness of methadone treatment. Over 100 outpatients were accepted into treatment and randomly assigned to one of four behavioral treatment modalities in addition to the usual methadone maintenance procedures. Sixty clients participated in treatment for six months or more. Treatment was provided by a paraprofessional counseling staff under the supervision of professionals. Client outcomes were evaluated and compared in terms of (1) urinalysis results for illicit drug use; (2) employment records, (3) arrest records, and (4) treatment retention and attendance. The assigned modality of behavioral treatment/counseling was found to bear no relationship to these outcomes. Despite the lack of differentiation in the outcomes of the overall clinical evaluation, data from specific experiments conducted during the course of the project indicate that both contingency management procedures and the emotionally-based behavior therapy procedures may have utility in the treatment of drug abuse. It is suggested that what is needed is more rigorous and systematic basic research with specific procedures and precisely focused outcome measures in order to develop an empirical base for the behavioral treatment of narcotics dependence. (Author)

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BEHAVIORAL TREATMENTS DURING OUTPATIENT METHADONE MAINTENANCE: A CONTROLLED EVALUATION*

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In the latter part of 1973 under a contract from the National Institute on Drug Abuse we established at Baltimore City Hospitals a program to evaluate the feasibility of using behavioral treatment in conjunction with methadone maintenance to improve the effectiveness of methadone treatment. Patients were accepted into treatment and randomly assigned to one of four behavioral treatment modalities in addition to the usual methadone maintenance procedures. For purposes of this study we conceptualized behavioral treatment as consisting of two different categories of procedures: First, contingency management which seeks to modify behavior by altering environmental contingencies and which utilizes (Table 1) the specific procedures of reinforcement, token economies, contingency contracts, and shaping. Second, the emotionally-based behavior therapy procedures which seek to modify behavior by alteration of the individual's emotional and behavioral responsivity to environmental stimuli, and which utilize (Table 2) the specific procedures of desensitization, assertiveness training, biofeedback, relaxation training, and yoga. While there may be considerable overlap between these two general classes of

TABLE 1: CONTINGENCY MANAGEMENT TECHNIQUES

Reinforcement
Token Economy
Contingency Contracts
Shaping

TABLE 2: BEHAVIOR THERAPY TECHNIQUES

Desensitization
Assertiveness Training
Biofeedback
Relaxation Training
Yoga

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behavioral treatment, they do seem to represent two relatively distinct schools of behavioral treatment, one of which seeks to change behavior by changing the environment and which can be implemented rather unilaterally by the treatment program, and the other of which seeks to change behavior by changing the individual and which requires considerable patient cooperation for implementation.

BEHAVIOR THERAPY	CONTINGENCY MANAGEMENT: YES	CONTINGENCY MANAGEMENT: NO
YES	A All	B Behavior Therapy
NO	C Contingency Management	D Decision Making (supportive counseling)

Figure 1

Consequently, our project utilized a 2x2 experimental design (Figure 1), in which one-half of the participants received contingency management treatment and one-half did not; in addition one-half the clients received treatment of the emotionally-based behavior therapy type, and one-half did not. Thus, clients in one of the four treatment cells received all of the behavioral treatment modalities, and clients in one of the cells received none of the behavioral treatment modalities. The treatment baseline upon which this experimental design was superimposed consisted of traditional supportive counseling in addition to methadone maintenance for all clients. Treatment was provided by a paraprofessional counseling staff under the supervision of professionals. Each client was scheduled to have a one-hour weekly individual session with his counselor. The goals were those typically pursued in drug abuse treatment programs (Table 3).

TABLE 3: PROJECT GOALS

1. Increase Work/School Involvement
2. Decrease Illicit Drug Use
3. Decrease Criminal Activity

Participants. The patients were drawn primarily from the predominantly White, urban, working-class community surrounding Baltimore City Hospitals. Sixty clients participated in treatment for a duration of six months or longer, and the data presented are for that subgroup. This represents 77.9 percent of all clients who began counseling and who had the opportunity to participate for six months. Participants were males and, as shown in Table 4, typically in their mid-twenties (mean 27.5), and predominantly White (87 percent). Their length of prior opiate addiction ranged between 4 and 25 years, with a

	6-MONTH PARTICIPANTS N=60
AGE	27.5 (22-43)
RACE	87%W 13%B
EDUCATION (yrs)	11.3+(6-18)
MARITAL STATUS	43%M 48%S 7%D 2%Sep
YEARS OF ADDICTION	9.2 (4-25)
METHADONE STATUS	18% new 20% re-entry 62% current
PRIOR METHADONE TREATMENT (mos)	22.7 (0-97)
LEGALLY ENFORCED TREATMENT	8%

Table 4

mean of 9.2 years. Eighty-two percent of the clients had previously been treated with methadone, and 62 percent were currently in methadone treatment when they transferred into this program. The duration of prior methadone treatment ranged between zero and 8 years with a mean of nearly 2 years. A small percentage of clients (8 percent) were legally required to be enrolled in some drug abuse treatment program. Examination of arrest records maintained by the Maryland State Police revealed that 83.1 percent of the clients had been arrested at least once prior to entering treatment, and that the average number of arrests was 5.8 per client.

Outcomes. Outcomes were assessed in terms of rates of drug use, employment status, and treatment participation. The first two months following program enrollment were treated as a baseline period during which initial values of these outcome measures were determined. The terminal or post-treatment levels on these measures were based upon months 5 and 6 of treatment. Change was evaluated by comparing the levels during months 1 and 2 with those during months 5 and 6. Drug use was measured as the proportion of urine samples positive for various drug classes. Urine samples were collected twice weekly on a random schedule under staff observation.

As it turns out, there are many different ways in which this evaluation of change can be performed. One is the measurement of the conditional probability of improving or worsening. The conditional probability of improving on a given measure is the percent of clients who improved given that during the baseline period they were not already perfect on that measure. Similarly, the conditional probability of worsening is the percent of clients who worsened on a measure given that during the baseline period they were not already as bad as possible on that measure. Figure 2 shows that on both employment and the several drug use measures clients were more likely to improve given the opportunity than they were to worsen given the opportunity.

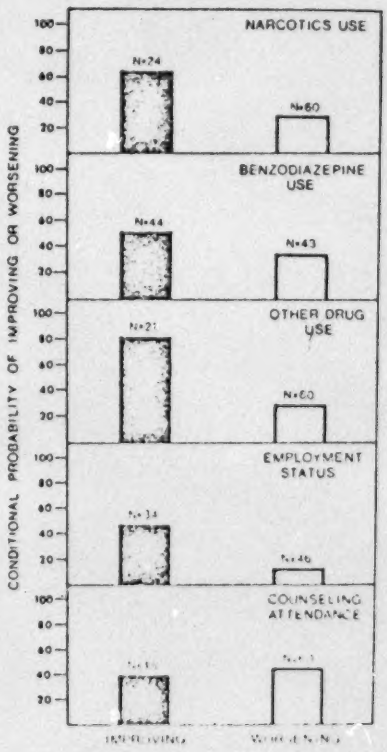

Figure 2

However, this probability-of-change analysis says nothing about the absolute levels of performance or absolute levels

of change. When absolute levels are examined (Table 5), one finds essentially no change over the six-month treatment period. Also, throughout, we have found there to be no differential effect of the assigned treatment modalities.

TABLE 5: MEAN LEVELS OF OUTCOME MEASURES.

	Baseline (mos. 1 & 2)	Treatment (mos. 5 & 6)
Employment (hrs per wk)	23	27
Drug Use (% samples positive)		
Narcotics	11%	14%
Benzodiazepines	52%	45%
Barbiturates and Others	10%	16%
Counseling Attendance (% wks attended)	75%	65%

Discussion. Overall, the differential treatment modalities, as implemented and evaluated in the present project, had no differential effects on client outcomes. However, the present study was conducted in a context where many factors acted to reduce the likelihood of observing any differential treatment efficacy:

1) Methadone treatment: All participants were concurrently receiving methadone maintenance treatment, and had done so for quite a long duration previously (mean = 22.7 months). This prior and concurrent treatment may have minimized the potential for further improvement during relatively short-term treatment.

2) Variability among clients: The extreme variability among clients (and, therefore, within groups) made between-group comparisons very insensitive to possible treatment effects. Ideally, all participants should initially display a specific problem to be treated. The adjacent figure (Figure 3) shows the variability existing at the start of treatment. We found ourselves in the peculiar position of operating a narcotics addiction treatment program in which only 40 percent of participants could improve according to our measure of narcotics use.

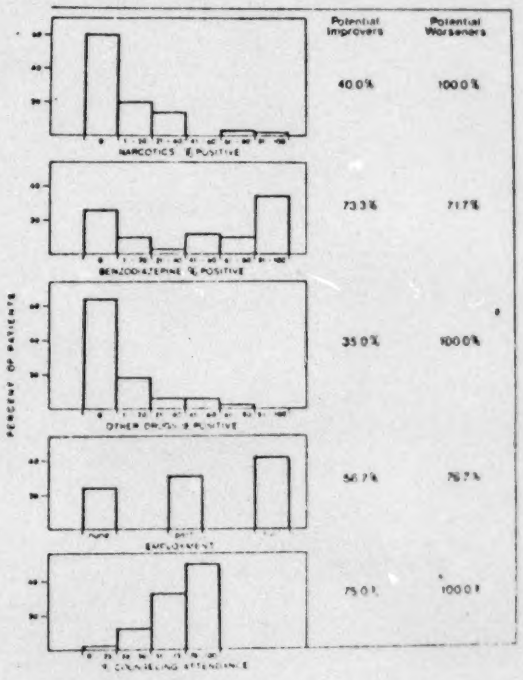

Figure 3

3) Diffusion of treatment goals: Partly because of the variability of presenting problems among clients, and partly because of the individualized nature of clinical treatment plans treatment efforts were diffused among too wide a range of goals. Different goals were pursued with different clients, and within a single client counselors changed goals and treatment focus in too-rapid succession.

4) Minimal quantity of treatment: The realities of counseling session duration and attendance resulted in clients receiving an average of 35 minutes per week of counseling time. As shown in the adjacent figure (Figure 4), for all four treatment modalities the vast majority of counseling time fell in the supportive counseling domain (this included basic information exchange concerning current status, etc.). The behavioral treatment procedures received very little attention during counseling sessions, with the consequence that the four treatment modalities were only minimally differentiated.

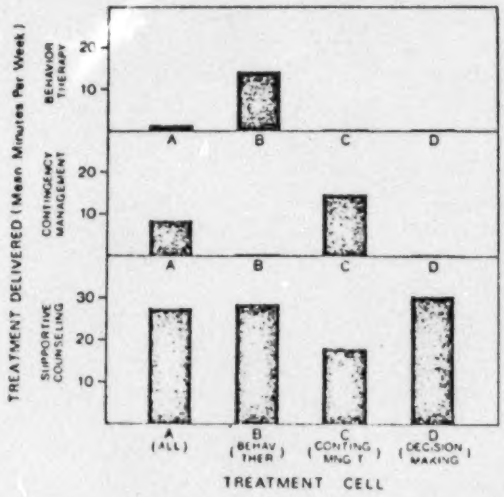

Figure 4

5) Below-optimal quality of treatment: Individualized treatment plans were designed and implemented by a paraprofessional staff without advanced training in behavioral techniques, and with insufficient professional supervision and direction.

5) Assessment of outcome by gross measures: Our assessment capability has been limited to very gross indices of long, complicated behavioral sequences, and has been insensitive to any possible changes in the behavioral components or precursors of employment, drug use, etc.

While the factors just discussed weaken the sensitivity of the comparison in this project, it should be pointed out that these factors all characterize the drug abuse treatment field as it now exists. Consequently, the results of our study are probably quite generalizable:

It seems proper to conclude that given the current state of our knowledge the introduction of behavioral treatment techniques into methadone programs as they now exist for use by counselors in individualized therapy will make little if any difference in client outcomes.

Despite the disappointing outcome of this overall comparative evaluation of differential treatments, the conduct of the study has permitted us to obtain some encouraging evidence that contingency management procedures might, under appropriate conditions, be used to enhance treatment efficacy. This evidence comes from both specifically-focused, controlled experiments and from uncontrolled case studies.

Focused Experimental Evaluation. The most powerful method for evaluating the efficacy of a procedure is to utilize a within-subject reversal design with patients initially selected as homogeneous with respect to the target behavior. This procedure has been utilized in our clinic by Stitzer, et al. (1976) to determine whether methadone take-home privileges might be used effectively as a contingent reinforcer to encourage behavior change among methadone maintenance patients. The target behavior was attendance at weekly counseling sessions. Sixteen clients participated, all of whom were very low-frequency attenders under baseline conditions. During the contingent phases the weekend medication take-home privilege was made contingent upon attending a counseling session of at least 40 minutes duration. The adjacent figure (Figure 5) illustrates the clarity with which this procedure demonstrated that contingent methadone take-home privileges will serve as an effective reinforcer for modifying patients' behavior. Further work is needed to determine whether this reinforcer can be sufficient to modify aspects of patients' behavior which are of greater clinical significance than counseling attendance.

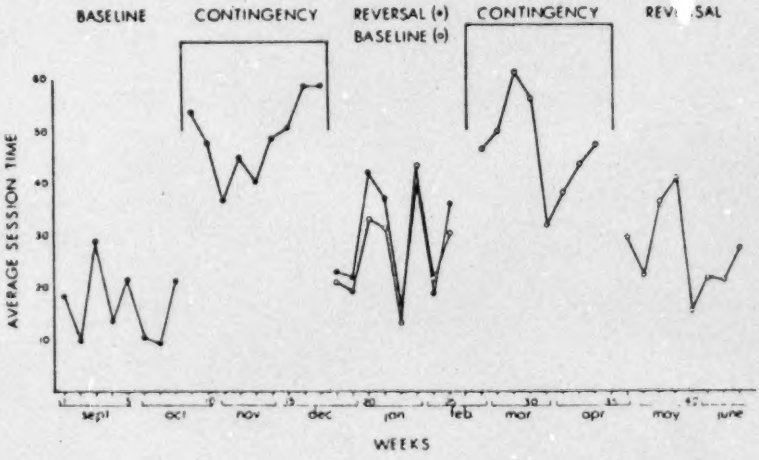

Figure 5

Case Studies. During the course of this project a number of individual case applications have illustrated how contingency management procedures might be used to reduce illicit drug use by methadone patients.

Although these case studies represent uncontrolled clinical observations, their description is instructive and suggests the possible strength of these procedures if they were to be evaluated more systematically.

Case #1: The adjacent figure (Figure 6) illustrates the case of a 29-year-old White male with a 7-year history of addiction and over 3 years of methadone maintenance treatment.

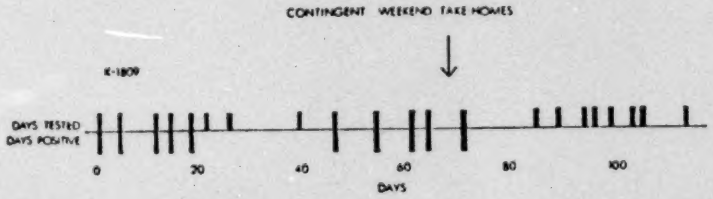

Figure 6

For several months he showed a pattern of fairly regular illicit narcotics use. When the weekend methadone take-home privilege was made contingent upon submission of opiate-free urine samples, this illicit use stopped.

Case #2: The patient was a 23-year-old White male with a seven-year addiction history and over two years of methadone maintenance treatment. He chronically showed evidence of illicit use of benzodiazepine minor tranquilizers. A contingent reinforcement was implemented in which one methadone take-home day per week was contingent upon benzodiazepine-free urine samples. (Two other take-home days were contingent upon working and attending counseling.) The adjacent figure (Figure 7) shows that this contingent arrangement was followed by a discontinuation of benzodiazepine use. During the subsequent seven months this patient did not resume his prior benzodiazepine abuse.

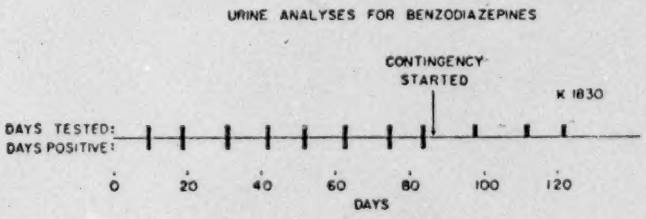

Figure 7

Case #3: A 31-year-old, White male with a 10-year addiction history and 7 years of methadone maintenance showed a pattern of chronic illicit use of benzodiazepine minor tranquilizers. For a period of at least one year 100 percent of urine samples had

been positive for benzodiazepines. A variety of prior attempts to attain a reduction in benzodiazepine use had no effect. A contingency was introduced in which a one-day methadone take-home privilege and a 5-mg methadone dose increase were both made contingent upon provision of a benzodiazepine-free urine sample. As shown in the adjacent figure (Figure 8), this was followed by the only reduction of benzodiazepine positives ever obtained with this client. It should be noted, however, that the reduction shown consisted of only two clean urines, and that the patient did return to chronic use after having received the contingent reinforcers.

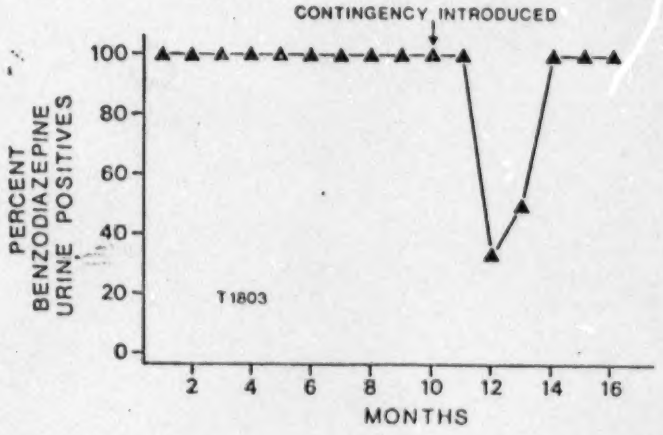

Figure 8

Case #4: A 27-year-old White male with a 5-year addiction history and 1 year of methadone maintenance treatment who showed a pattern of frequent illicit benzodiazepine use indicated that he wished to be gradually detoxified from methadone. He was informed that this was contraindicated at the time due to his continuing illicit drug use, but that the clinic would be fully cooperative with a gradual detoxification contingent upon his discontinuing his illicit benzodiazepine use. As the adjacent figure (Figure 9) shows, this contingent arrangement, using the opportunity for methadone detoxification as a reinforcer, was followed by a discontinuation of benzodiazepine use, and the patient showed no evidence of further benzodiazepine use during the four months he continued reporting to the clinic.

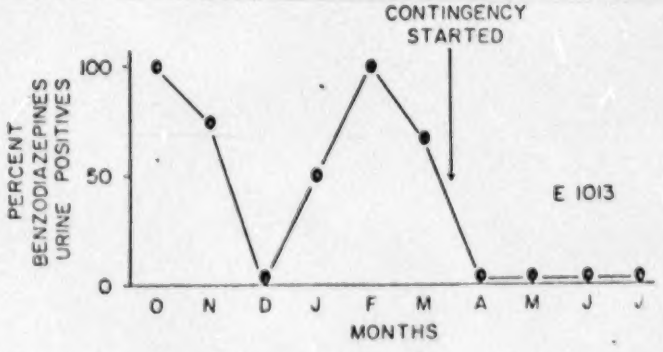

Figure 9

Case #5: An especially difficult case was presented by a 25-year-old White male with a 9-year addiction history and 2 years of methadone maintenance who showed a pattern of chronic illicit narcotics use despite maintenance on 48 mg of methadone daily. Prior efforts to eliminate this illicit narcotics use by offering weekend medication take-home privileges contingent upon narcotics-free urine samples were not effective. The client was subsequently put on a split-dose regimen such that on weekdays he had to visit the clinic twice daily and received only half of his daily dose each time. Removal of the split-dose regimen, which the client found inconvenient, was made contingent upon a single narcotics-free urine. In addition, the client was offered a 12-mg methadone dose increase contingent upon receipt of the first clean urine and was offered a weekend take-home day contingent upon each urine sample free of narcotics. The data are presented in Figure 10. After three weeks of a split-dose regimen, the combination of contingencies successfully eliminated illicit narcotics use in this client. Clean urines persisted for at least 4 months.

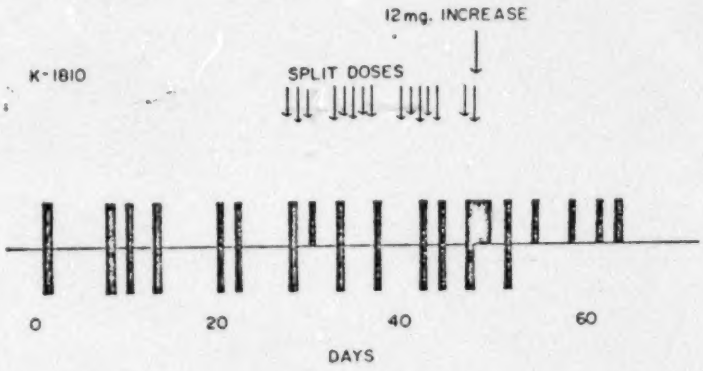

Figure 10

These examples suggest rather strongly that under some conditions the contingent alteration of methadone clinic privileges (medication pick-up/take-home schedule, medication dosage) can be a sufficiently powerful reinforcer to modify patients' illicit drug use. Our clinic is now conducting more rigorous and systematic studies in this area.

Conclusion. Because of the diversity observed clinically among drug abuse patients experimental programs which seek to assess behavioral treatment procedures by evaluating their efficacy in the overall treatment of undifferentiated clinical populations are likely to yield considerable frustration and confusion. However, our focused experimental evaluations and case studies suggest that systematically applied contingency management procedures can be used effectively to enhance methadone maintenance treatment. We will be better able to evaluate and compare the efficacy of

various therapeutic techniques if in future efforts we work with populations which are homogeneous with respect to a specific problem behavior, and therapeutic attentions are directed toward alteration of that specific behavior.

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